ATTACHMENT 10.105
HOUSTONKEMP:
REVIEW OF THE ERA'S DWAT

ATCO 2020-24 REVISED PLAN

EIM # 99059310

PUBLIC

12 June 2019

HOUSTONKEMP
Economists

Review of the ERA's discounted weighted average tariff analysis

A report prepared for ATCO Gas Australia Pty Ltd

5 June 2019

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1. Overview and conclusions

We have been asked by ATCO Gas Australia Pty Ltd (ATCO) to review the Economic Regulation Authority's (ERA) use and application of 'discounted weighted average tariff' analysis (DWAT) in its Draft Decision for ATCO's 2020 to 2024 access arrangement period (AA5) in its assessment of ATCO's proposed greenfield and brownfield capital expenditure.

The DWAT is the constant price (in real terms) required to exactly ensure that a firm's return on an investment is equal to its overall rate of return. In the case of ATCO, this requires calculating the present value of revenue (as measured by the total cost, ie the sum of opex, return on assets and depreciation) across the life of ATCO's proposed investment, and dividing by the present value of the quantity of gas sold. The DWAT is expressed in dollars per gigajoule (GJ).

The ERA has compared the DWAT without any additional investment (ie, just the 'base' customers) to the DWAT with the addition of new greenfield customers, and the addition of new brownfield customers. The ERA finds that the scenarios with greenfield and brownfield customers have a higher DWAT than in the scenario with only base customers. The ERA takes this as evidence that 'confirms the NPV results'.[1]

Intuitively, an increase in the DWAT for all customers following a new investment might appear to suggest that the investment may have a negative net present value (NPV), resulting in existing customers needing to cross-subsidise the investment through an increase in their tariffs. However, closer examination shows that this is not always the case, and that an increase in the DWAT can be consistent with a positive NPV investment. Further, a decrease in DWAT can also be consistent with a negative NPV investment.

The DWAT model adopted by the ERA does not take any account of the differences in the effective per GJ charge that arises for customers with different usage levels where tariffs are not based solely on a single usage charge.

The tariffs that are expected to apply to ATCO's new greenfields and brownfields customers (tariffs B2 and B3) contain both a fixed element and varying tiers for usage-based charges. Under this tariff structure, the lower consumption ATCO is forecasting for new customers means that they face a higher effective charge per GJ than existing customers. This impact is not picked up in the ERA's DWAT analysis.

In particular our report demonstrates that a greenfield or brownfield investment with a *low* cost that results in a *positive* NPV under the incremental revenue test (and therefore an implied *decrease* in actual tariffs to existing consumers) could result in an *increase* in the DWAT calculated using the ERA's approach, if the new customers purchase a *lower* amount of gas than existing customers. It also shows that the reverse may be the case (if new customers purchase *more* gas than existing customers).

As a consequence, assessing changes in the DWAT using the formula and approach adopted by the ERA does not provide any additional confirmation or insights in relation to the NPV analysis, as it may be either positively or negatively correlated with the findings of the NPV assessment.

Rule 79 of the National Gas Rules (NGR) requires the application of the incremental revenue test, in order to demonstrate that greenfield and brownfield investment is conforming capital expenditure. The DWAT analysis as conducted by the ERA does not provide any additional information of relevance to this assessment.

[1] ERA, *Draft decision on proposed revisions to the mid-west and south-west gas distribution systems access arrangement for 2020 to 2024*, 18 April 2019, p 121.

2. The ERA's calculation of the discounted weighted average tariff

In its Draft Decision for ATCO's AA5 access arrangement, the ERA has assessed whether ATCO's proposed greenfield and brownfields investment for AA5 is conforming capex for the purposes of the NGR, using two approaches:

- the 'incremental revenue' NPV test set out in Rule 79 of the NGR; and
- undertaking an analysis of the change in the 'discounted weighted average tariff' implied by the investment, in order to 'confirm' the results of the incremental revenue test.

The ERA concluded that:[2]

> The DWAT analysis confirms the NPV results [..]. As the DWAT is higher under the scenarios with greenfield or brownfield customers connected, the existing customers would pay more than if these customers were not connected.

The remainder of this section describes the ERA's calculation of the DWAT and the conclusions that it draws from this analysis in its Draft Decision.

2.1 Calculation of the DWAT

The ERA defines the DWAT as:[3]

> the constant price in real terms (after adjusting for inflation), which, applied to each unit sold over the evaluated life of the investment producing the product, gives the required overall rate of return on the investment.

That is, it is the constant price (in real terms) required to exactly ensure that a firm's return on an investment is equal to its overall rate of return.

The formula for the calculation set out in Appendix 6 of the ERA's Draft Decision is:[4]

$$DWAT = \frac{Present\ value\ of\ Revenue}{Present\ value\ of\ quantity\ sold} = \frac{\sum_t \frac{Revenue_t}{(1+r)^t}}{\sum_t \frac{Quantity_t}{(1+r)^t}}$$

where:

- t is the year, with the initial year set at zero;[5]

[2] ERA, *Draft decision on proposed revisions to the mid-west and south-west gas distribution systems access arrangement for 2020 to 2024*, 18 April 2019, para 552, p 121.

[3] ERA, *Draft decision on proposed revisions to the mid-west and south-west gas distribution systems access arrangement for 2020 to 2024*, 18 April 2019, p 263.

[4] ERA, *Draft decision on proposed revisions to the mid-west and south-west gas distribution systems access arrangement for 2020 to 2024*, 18 April 2019, p 263.

[5] We note that in practice the ERA's modelling of the DWAT for ATCO applies the discount rate to 2020, the first year of the period over which the present values have been calculated. That is, t for the first year has been set as one, not zero. For consistency, our analysis in section 4 follows the ERA's approach of discounting the first year. The difference in the treatment of the initial year is not material to the outcomes.

- $Revenue_t$ is the revenue required in year t (in real terms) to recover costs, including an appropriate return on investment, ie, equal to the total costs in year t;[6]
- r is the discount rate (real weighted average cost of capital, WACC); and
- $Quantity_t$ is the quantity of product sold in year t.

The ERA has defined revenue for the purposes of the DWAT analysis to be that which is sufficient to cover ATCO's costs.[7] Therefore, revenue represents the sum of opex, the return on assets (including the proposed investment for AA5 where the DWAT is calculated for the greenfield and brownfield scenarios) and depreciation.

The ERA has suggested that changes in the DWAT can be used to 'confirm' the results of the NPV analysis of incremental revenue it has undertaken in relation to ATCO's proposed greenfield and brownfield investment.[8]

The ERA's draft decision presents its DWAT calculations, applied to:[9]

- base customers (only), resulting in a DWAT of $8.28 per GJ;
- base and brownfield customers, resulting in a DWAT of $8.30 per GJ; and
- base and greenfield customers, resulting in a DWAT of $8.67 per GJ.

Under these calculations, the scenarios with greenfield and brownfield customers have a higher DWAT than the scenario with only base customers. The ERA takes this as evidence that 'confirms the NPV results'.[10]

Intuitively, an increase in the DWAT for all customers following a new investment might appear to suggest that the investment may have a negative NPV, resulting in existing customers needing to cross-subsidise the investment through an increase in their tariffs. However, closer examination shows that this is not always the case, and that an increase in the DWAT can be consistent with a positive NPV investment. Further, a decrease in DWAT can also be consistent with a negative NPV investment.

Assessing changes in the DWAT using the formula and approach adopted by the ERA therefore does not provide any additional confirmation or insights in relation to the incremental revenue NPV analysis. The remaining sections of this report step through our reasoning for this conclusion, and provide worked examples that highlight why there will often not be a direct correlation between the incremental NPV assessment and the calculation of DWATs.

[6] Alternatively, if revenue is in nominal terms, a nominal WACC can be applied when calculating the present value of revenue.

[7] ERA, *Draft decision on proposed revisions to the mid-west and south-west gas distribution systems access arrangement for 2020 to 2024*, 18 April 2019, p 264.

[8] ERA, *Draft decision on proposed revisions to the mid-west and south-west gas distribution systems access arrangement for 2020 to 2024*, 18 April 2019, p 121.

[9] ERA, *Draft decision on proposed revisions to the mid-west and south-west gas distribution systems access arrangement for 2020 to 2024*, 18 April 2019, p 121.

[10] ERA, *Draft decision on proposed revisions to the mid-west and south-west gas distribution systems access arrangement for 2020 to 2024*, 18 April 2019, p 121.

3. ATCO's tariff structures and usage assumptions for greenfield and brownfield customers

3.1 ATCO's tariff structures for greenfield and brownfield customers

ATCO's modelling assumes that new brownfield and greenfield customers are charged based on B2 and B3 tariffs. The B2 and B3 tariffs are structured so that:[11]

- the B2 tariff is comprised of:
  - a standing charge;
  - a usage charge, which is in turn comprised of:
    - a charge rate for the first 274 MJ per day of gas; and
    - a (lower) charge rate for usage in excess of the first 274 MJ per day of gas; and
- the B3 tariff is comprised of:
  - a standing charge;
  - a usage charge, which is in turn comprised of:
    - a charge rate of $0 per GJ for the first 5 MJ per day of gas;
    - a charge rate for the next 22 MJ per day of gas; and
    - a (lower) charge rate for usage in excess of the first 27 MJ per day of gas.

Put simply, both of the tariffs that are expected to apply to new brownfield and greenfield customers include both a standing charge and tiered usage charges.

3.2 ATCO's assumptions on usage per customer

Forecasting conducted for ATCO shows that the amount of gas purchased per customer by greenfield and brownfield customers is expected to be lower than that for base customers.

For example, base customers on the B2 tariff in 2019 are expected to use approximately 113 GJ per customer per year, whereas greenfield and brownfield customers are expected to use only 83 GJ per customer per year, ie, around 74 per cent of the base customer usage.[12]

We have calculated the per GJ total cost that base customers would expect to pay on the B2 and B3 tariffs, compared to the per GJ total cost for greenfield and brownfield customers. We have conducted these calculations for three sets of tariffs, namely:

- ATCO's current 2019 tariffs;
- the ERA's 2019 'cost-recovery' tariffs, as set out in its Draft Decision; and
- ATCO's proposed AA5 tariffs for 2020 (expressed in December 2019 dollar terms), as set out in its Revised Proposal.

[11] ATCO, *Tariff variation report 2019*, 5 November 2018, p 7.

[12] Core Energy, *AGA AA5 gas demand forecast*, May 2019, p 77.

Table 1 below shows that under ATCO's current 2019 tariffs, a greenfield or brownfield customer on the B2 tariff could expect to pay an overall cost per GJ of around $8.50, compared to a base customer who would pay approximately $7.53 per GJ.

The higher effective cost per GJ for greenfield and brownfield customers is a consequence of their lower usage, which means both that the fixed charge per customer is spread over a lower number of GJs, and that a greater proportion of those customers' usage charges are at the higher usage rate.

Table 1: Indicative costs per GJ paid over one year

Tariff	Pricing assumption	Base customer	Greenfield/brownfield customer	Base customer plus greenfield/brownfield customer
B2	2019 existing tariffs	7.53	8.50	7.94
	ERA 2019 'cost-recovery' tariffs	9.87	11.15	10.42
	ATCO proposed AA5 tariffs for 2020	8.30	9.37	8.75
B3	2019 existing tariffs	11.99	23.18	15.36
	ERA 2019 'cost-recovery' tariffs	15.58	26.70	18.93
	ATCO proposed AA5 tariffs for 2020	14.16	24.75	17.35

Source: See appendix A1

The analysis in the above table shows that, under all three tariff assumptions, the average total price paid per GJ increases after the inclusion of a greenfield or brownfield customer, despite the tariffs charged to the base customers remaining constant.

The impact of ATCO's tariff structures and the assumption of lower usage forecasts for greenfield and brownfield customers in increasing the effective per GJ charge paid by these new customers has important implications for the conclusions that can be drawn from the ERA's DWAT analysis, as we discuss in the following section.

4. Implications for conclusions that can be drawn from DWAT assessment

The ERA's DWAT calculation is based on the expression of revenue in per GJ terms.

However, as shown in the previous section, the effective per GJ charge paid by each customer depends both on the tariff structure those customers face and their gigajoule consumption. Where tariffs contain fixed as well as usage-based elements, and/or where the usage-based elements vary according to the amount of consumption, the effective per GJ charge will depend fundamentally on the amount consumed by those customers. Customers with higher (lower) consumption will face an effective charge which is lower (higher) than that for customers with lower (higher) consumption.

The DWAT model adopted by the ERA does not take any account of the differences in the effective per GJ charges that arise where tariff structures are not limited to single rate tariffs without a standing charge, and where there are material differences in the forecast consumption between new and existing customers. Both of these circumstances apply to ATCO, as described in the previous section.

In the presence of standing charges and/or tiered usage charges, mixing customer groups that purchase different quantities can result in movements in the DWAT that are not necessarily correlated with the findings of the NPV analysis under the incremental revenue test required by Rule 79 of the NGR.

In particular:

- a greenfield or brownfield investment with a *high* cost that results in a *negative* NPV under the incremental revenue test (and therefore an implied *increase* in actual tariffs to existing consumers in order to cover the investment cost) could result in a *decrease* in the DWAT calculated using the ERA's approach, if the new customers purchase a *higher* amount of gas than existing customers; whereas
- a greenfield or brownfield investment with a *low* cost that results in a *positive* NPV under the incremental revenue test (and therefore an implied *decrease* in actual tariffs to existing consumers) could result in an *increase* in the DWAT calculated using the ERA's approach, if the new customers purchase a *lower* amount of gas than existing customers.

The interpretation of an increase in DWAT as being equivalent to an investment that raises prices for existing users will therefore not be correct in all cases, and in particular appears unlikely to be correct in the circumstances of the assessment for ATCO. Similarly, the interpretation of a decrease in DWAT as being equivalent to an investment that lowers prices for existing users will also not always be correct in all cases.

As a consequence, the DWAT analysis has no value in either confirming or refuting the findings of the incremental revenue test required under Rule 79 of the NGR, in circumstances where tariffs are more complex than a single usage charge and where the usage of existing and new customers is expected to differ.

The following two sections present two worked examples of where the incremental revenue test and the DWAT analysis give different results. The worked examples have been purposefully simplified to enable clear presentation of the calculations and focus on a case where the tariffs have only a fixed and a single variable element. However, the principles adopted are the same as those reflected in the ERA's DWAT model, and similar examples can be derived for tariffs that incorporate more than one tier of usage charges.

4.1 Worked example #1 – positive NPV but increase in DWAT

Suppose a firm is currently serving one customer that consumed 100 GJ of gas per year, with a tariff composed of:

- a standing charge equal to $300 per year (in real terms); and
- a usage charge equal to $5 per GJ (in real terms).

Suppose that the firm's total cost (in real terms and including an appropriate return on capital) for serving the customer is $800 per year, and the firm has a WACC of 6.2 per cent. Therefore, the firm's revenue exactly covers its costs.

Now suppose the firm is considering an investment to connect a new customer, such that:

- the incremental cost of connecting the customer is $680 per year (in real terms and including an appropriate return on capital);
- the new customer would consume 80 GJ of gas per year;
- the investment is to be considered over a five year horizon; and
- both the existing and the new customer would continue to be charged the same tariff.

The NPV analysis of the incremental costs and benefits of the investment, consistent with the Rule 79 test in the NGR, is set out in table 2 below. In particular, table 2 shows that the investment has a positive net present value, and so passes the incremental revenue test.

Table 2: Incremental NPV of investment 1

	NPV	Year 1	Year 2	Year 3	Year 4	Year 5
Standing charge	1,257	300	300	300	300	300
Usage charge	1,676	400	400	400	400	400
Incremental revenue	2,933	700	700	700	700	700
Incremental cost	2,849	680	680	680	680	680
NPV of investment	**84**					

Tables 3 and 4 present the DWAT analysis, based on the price required to exactly cover costs (including an appropriate return), with and without the investment.

Table 3: DWAT without the investment

	NPV	Year 1	Year 2	Year 3	Year 4	Year 5
Total revenue/cost[13] ($)	3,352	800	800	800	800	800
Quantity (GJ)	419	100	100	100	100	100
DWAT ($/GJ)	**8.00**					

Table 4: DWAT with the investment

	NPV	Year 1	Year 2	Year 3	Year 4	Year 5
Total cost ($)	6,201	1,480	1,480	1,480	1,480	1,480
Quantity (GJ)	754	180	180	180	180	180
DWAT ($/GJ)	**8.22**					

We can see that the DWAT has *increased* with the investment, despite the present value of the incremental revenues outweighing the present value of the incremental costs.

As discussed above, the fundamental disconnect is that the DWAT calculation fails to account for the structure of the tariff, and the different quantities of gas consumed by the two customers. Since the new customer purchases less gas per year, its average total cost per GJ is higher than for the existing customer, as shown in table 5.

Table 5: Effective price per GJ paid by each customer each year

	Standing charge ($)	Usage charge ($)	Gas purchased (GJ)	Total paid ($)	Average price per GJ ($/GJ)
Existing customer	300	5	100	800	8.00
New customer	300	5	80	700	8.75
Total	**600**	**5**	**180**	**1,500**	**8.33**

Note The average price paid per GJ of $8.33 in table 5 is higher that the DWAT of $8.22 calculated in table 4 because the investment has a positive NPV, so that the firm earns positive profits with the investment

In this example the actual tariff charged to both customers was held fixed, so that the existing customer does not pay more than if the new customer was not connected. The increase in the DWAT calculated arises solely as a consequence of not recognising the difference in the effective per GJ charge paid by new and existing customers, rather than implying that there is necessarily an increase in charges for existing customers. The ERA is therefore incorrect in asserting as a matter of principle that:[14]

[13] For the base customers, total costs equal total revenue.

[14] ERA, *Draft decision on proposed revisions to the mid-west and south-west gas distribution systems access arrangement for 2020 to 2024*, 18 April 2019, para 552, p 121.

As the DWAT is higher under the scenarios with greenfield or brownfield customers connected, the existing customers would pay more than if these customers were not connected.

In the example presented in this section, since the investment results in a positive net present value, existing customers may pay *less* if the firm invests, since it may have the ability to lower tariffs, despite there being an increase in the DWAT.

For tariffs with only a standing charge and a single usage charge, the DWAT calculation can be amended to give results that are consistent with the NPV analysis, by subtracting from the required revenue the amount that is recovered through the standing charge.[15]

Tables 6 and 7 below set out this 'standing charge-adjusted' DWAT, which decreases in the investment case, since the positive NPV of the investment allows for a decrease in the per GJ component of the tariff.

Table 6: Adjusted DWAT without the investment

	NPV	Year 1	Year 2	Year 3	Year 4	Year 5
Total revenue[16] ($)	3,352	800	800	800	800	800
Standing charge component ($)	1,257	300	300	300	300	300
Residual revenue ($)	2,095	500	500	500	500	500
Quantity (GJ)	419.0	100	100	100	100	100
Adjusted DWAT ($/GJ)	**5.00**					

Table 7: Adjusted DWAT with the investment

	NPV	Year 1	Year 2	Year 3	Year 4	Year 5
Total cost ($)	6,201	1,480	1,480	1,480	1,480	1,480
Standing charge component ($)	2,514	600	600	600	600	600
Residual revenue ($)	3,687	880	880	880	880	880
Quantity (GJ)	754.1	180	180	180	180	180
Adjusted DWAT ($/GJ)	**4.89**					

We note that although this adjusted DWAT might be useful in specific cases for assessing the potential long-term tariff impact of an investment, it does not provide any additional information not already captured by the NPV analysis.

[15] Further adjustment to the DWAT calculation would need to be undertaken to also accommodate different tiers of usage charges.

[16] For the base customers, total costs equal total revenue.

4.2 Worked example #2 – negative NPV but decrease in DWAT

Suppose the same firm as in the previous example is now considering a different investment to connect a new customer, such that:

- the incremental cost of connecting the customer is $1,400 per year (in real terms);
- the new customer would consume 200 GJ of gas per year;
- the investment is to be considered over a five year horizon; and
- both the existing and the new customer would continue to be charged the same tariff.

The incremental benefits of this investment are outweighed by the incremental costs, as shown in table 8.

Table 8: Incremental NPV of investment 2

	NPV	Year 1	Year 2	Year 3	Year 4	Year 5
Standing charge	1,257	300	300	300	300	300
Usage charge	4,190	1,000	1,000	1,000	1,000	1,000
Incremental revenue	5,446	1,300	1,300	1,300	1,300	1,300
Incremental cost	5,865	1,400	1,400	1,400	1,400	1,400
NPV of investment	**-419**					

Tables 9 and 10 present the DWAT analysis, based on the price required to exactly cover costs (including an appropriate return), with and without the investment.

Table 9: DWAT without the investment

	NPV	Year 1	Year 2	Year 3	Year 4	Year 5
Total revenue[17] ($)	3,352	800	800	800	800	800
Quantity (GJ)	419	100	100	100	100	100
DWAT ($/GJ)	**8.00**					

[17] For the base customers, total costs equal total revenue.

Table 10: DWAT with the investment

	NPV	Year 1	Year 2	Year 3	Year 4	Year 5
Total cost ($)	9,217	2,200	2,200	2,200	2,200	2,200
Quantity (GJ)	1,257	300	300	300	300	300
DWAT ($/GJ)	**7.33**					

In this case, although the investment has a negative NPV under the incremental revenue test, the DWAT is lower with the investment than without it.

In contrast with the earlier example, the incongruity between the NPV and DWAT analysis in this case is because the new customers pay a *lower* overall effective per GJ charge, since they are able to spread the standing charge over their larger gas consumption.

5. Consistency with National Gas Rules

Rules 79 of the National Gas Rules states that new capital expenditure is justifiable if:[18]

> the present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure; …

The incremental revenue test is therefore the test required under the NGR in order to demonstrate that greenfield and brownfield investment to enable the connection of new customers is conforming capital expenditure for the purposes of being included as part of a service provider's capital base.

The application of a DWAT test in the manner adopted by the ERA in its Draft Decision to 'confirm' the results of the incremental revenue test is not standard practice. In particular, it is not a test that has been used by the Australian Energy Regulator (AER) in assessing capex for regulated gas businesses under the same NGR provisions.[19]

More fundamentally, the preceding analysis has shown that there are circumstances where the results of the DWAT calculation (using the approach adopted by the ERA) do not move in a direction that is consistent with the findings of the incremental revenue test. These circumstances include where the tariffs customers face contain fixed elements and/or different consumption tiers and where new customers' usage is expected to differ from that of existing customers. Both of these are circumstances that currently apply to ATCO.

As a consequence, it is incorrect to place any weight on the ERA's DWAT analysis as being able to either confirm or refute the results of the incremental revenue test applied to ATCO for AA5, as the ERA has sought to do in its Draft Decision.[20]

[18] National Gas Rules, rule 79(2)(b).

[19] The most recent reference we have found is in a submission by GasNet Australia as part of its proposed Access Arrangement for the period commencing 1 January 2003. See: GasNet Australia, *Response to submissions on ACCC issues paper*, 12 June 2002, p 10.

[20] ERA, *Draft decision on proposed revisions to the mid-west and south-west gas distribution systems access arrangement for 2020 to 2024*, 18 April 2019, p 121.

A1. Calculation of estimated per GJ costs

In this section we set out estimates of the per GJ cost to existing and greenfield and brownfield customers under a range of tariff assumptions.

Tables A1 and A2 below set out the three tariffs used for the calculation of the per GJ costs to customers.

Table A1: B2 tariff yearly pricing assumptions

Component	2019 existing tariff	2019 cost-recovery tariff	ATCO AA5 proposed tariff for 2020
Standing charge ($)	226.74	297.43	250.59
Usage charge – first 100 GJ ($/GJ)	5.77	7.57	6.35
Usage charge – all remaining GJ ($/GJ)	3.44	4.51	3.81

Source: For simplicity, gas usage is assumed to be constant throughout the year so that a yearly tariff could be applied instead of a per day tariff; ERA, Draft decision on proposed revisions to the mid-west and south-west gas distribution systems access arrangement for 2020 to 2024, 18 April 2019, p 118; ATCO 2020-24 revised plan – access arrangement information for ATCO's mid-west and south-west gas distribution system

Table A2: B3 tariff yearly pricing assumptions

Component	2019 existing tariff	2019 cost-recovery tariff	ATCO AA5 proposed tariff for 2020
Standing charge ($)	116.84	116.92	116.84
Usage charge – first 100 GJ ($/GJ)	0.00	0.00	0.00
Usage charge – next 8.03 GJ ($/GJ)	4.89	9.96	7.16
Usage charge – all remaining GJ ($/GJ)	2.11	4.30	5.11

Source: For simplicity, gas usage is assumed to be constant throughout the year so that a yearly tariff could be applied instead of a per day tariff; ERA, Draft decision on proposed revisions to the mid-west and south-west gas distribution systems access arrangement for 2020 to 2024, 18 April 2019, p 118; ATCO 2020-24 revised plan – access arrangement information for ATCO's mid-west and south-west gas distribution system

Tables A3 and A4 below set out the demand per connection forecasts used for calculation of the per GJ costs to customers.

Table A3: B2 demand per connection forecast

	2017	2018	2019	2020	2021	2022	2023	2024
Existing 2018 customers	115.0	113.2	112.5	112.5	112.0	111.5	110.8	109.4
Greenfield/brownfield customers			83.0	83.3	83.4	83.5	83.2	82.6

Source: Core Energy, AGA AA5 gas demand forecast, May 2019, p 77

Table A4: B3 demand per connection forecast

	2017	2018	2019	2020	2021	2022	2023	2024
Existing 2018 customers	13.9	13.8	13.7	13.3	13.0	12.8	12.5	12.2
Greenfield/brownfield customers			5.9	5.8	6.9	7.4	7.8	8.1

Source: Core Energy, AGA AA5 gas demand forecast, May 2019, p 82

Tables A5 to A7 set out the indicative costs per GJ paid over one year on the B2 tariff under each pricing assumption.

Table A5: Indicative costs per GJ paid over one year on the B2 tariff – 2019 existing tariffs

	Base customers	Greenfield/brownfield customers	Base customer plus greenfield/brownfield customer
Quantity used (GJ)	112.50	83.00	195.50
Standing charge ($)	226.74	226.74	453.48
Usage charge – first 100 GJ ($)	577.00	478.91	1,055.91
Usage charge – all remaining GJ ($)	43.00	0.00	43.00
Total charge ($)	846.74	705.65	1,552.39
Total charge per GJ ($/GJ)	**7.53**	**8.50**	**7.94**

Table A6: Indicative costs per GJ paid over one year on the B2 tariff – 2019 cost-recovery tariffs

	Base customers	Greenfield/brownfield customers	Base customer plus greenfield/brownfield customer
Quantity used (GJ)	112.50	83.00	195.50
Standing charge ($)	297.43	297.43	594.86
Usage charge – first 100 GJ ($)	757.00	628.31	1,385.31
Usage charge – all remaining GJ ($)	56.38	0.00	56.38
Total charge ($)	1,110.81	925.74	2,036.55
Total charge per GJ ($/GJ)	**9.87**	**11.15**	**10.42**

Table A7: Indicative costs per GJ paid over one year on the B2 tariff – ATCO AA5 proposed tariffs for 2020

	Base customers	Greenfield/brownfield customers	Base customer plus greenfield/brownfield customer
Quantity used (GJ)	112.50	83.00	195.50
Standing charge ($)	250.59	250.59	501.18
Usage charge – first 100 GJ ($)	635.00	527.05	1,162.05
Usage charge – all remaining GJ ($)	47.63	0.00	47.63
Total charge ($)	933.22	777.64	1,710.86
Total charge per GJ ($/GJ)	**8.30**	**9.37**	**8.75**

Tables A8 to A10 set out the indicative costs per GJ paid over one year on the B3 tariff under each pricing assumption.

Table A8: Indicative costs per GJ paid over one year on the B3 tariff – 2019 existing tariffs

	Base customers	Greenfield/brownfield customers	Base customer plus greenfield/brownfield customer
Quantity used (GJ)	13.70	5.90	19.60
Standing charge ($)	116.84	116.84	233.68
Usage charge – first 1.825 GJ ($)	0.00	0.00	0.00
Usage charge – next 8.03 GJ ($)	39.27	19.93	59.19
Usage charge – all remaining GJ ($)	8.11	0.00	8.11
Total charge ($)	164.22	136.77	300.99
Total charge per GJ ($/GJ)	**11.99**	**23.18**	**15.36**

Table A9: Indicative costs per GJ paid over one year on the B3 tariff – 2019 cost-recovery tariffs

	Base customers	Greenfield/brownfield customers	Base customer plus greenfield/brownfield customer
Quantity used (GJ)	13.70	5.90	19.60
Standing charge ($)	116.92	116.92	233.84
Usage charge – first 1.825 GJ ($)	0.00	0.00	0.00
Usage charge – next 8.03 GJ ($)	79.98	40.59	120.57
Usage charge – all remaining GJ ($)	16.53	0.00	16.53
Total charge ($)	213.43	157.51	370.94
Total charge per GJ ($/GJ)	**15.58**	**26.70**	**18.93**

Table A10: Indicative costs per GJ paid over one year on the B3 tariff – ATCO AA5 proposed tariffs for 2020

	Base customers	Greenfield/brownfield customers	Base customer plus greenfield/brownfield customer
Quantity used (GJ)	13.70	5.90	19.60
Standing charge ($)	116.84	116.84	233.68
Usage charge – first 1.825 GJ ($)	0.00	0.00	0.00
Usage charge – next 8.03 GJ ($)	57.49	29.18	86.67
Usage charge – all remaining GJ ($)	19.65	0.00	19.65
Total charge ($)	193.98	146.02	340.00
Total charge per GJ ($/GJ)	**14.16**	**24.75**	**17.35**

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